



# Primary school pupils' emotional experiences of synchronous audio-led online communication during online one-to-one tuition

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## ABSTRACT

Understanding the emotional aspects of pedagogical approaches for primary-aged school children engaged in synchronous audio-led one-to-one online tuition is the focus of this qualitative research study. Data are drawn from the process evaluation element of a large randomized control trial of a 27-week, affordable online mathematics tuition intervention that involved 600 pupils spread across 64 schools in England. Focus groups and interviews conducted with pupils and school staff were used to investigate the pupils' emotional experiences of the mathematics intervention, with reference to the pupil–tutor relationship and the online environment. Our findings suggest that audio-led synchronous one-to-one online tuition provides variable and limited access to emotionally positive pupil–tutor relationships. Whilst our study largely supports the argument that synchronous technologies enhance the sense of communicating with a “real” person (social presence), we conclude that this does not necessarily have a positive effect. We found that the quality of social presence is contingent on the quality of the pupil–tutor relationship. This paper advances our understanding of social presence theory and highlights the need for program developers to facilitate, and tutors, to consider pupil-sensitive collaborative teaching approaches.

## 1. Introduction

Online technologies are increasingly being used in education (Jopling, 2012: 310); this is accompanied by a growing body of academic research and debate on online learning environments (OLEs) and the social and emotional interactions that mediate them (Artino, 2012; Borup, West, & Graham, 2012; Bryde, 2001; Hastie, Chen, & Kuo, 2007; Kear, 2010; Kear, Chetwynd, Williams & Donelan, 2012; Macdonald & Campbell, 2012; Price, Richardson, & Jelfs, 2007; Stern, Tucker, Harding, Holzer and Elbertson 2015). One-to-one online tuition is part of this expansion of online technologies, propelled by its promise of expert individualized teaching made more widely accessible owing to its lower cost compared to its face-to-face equivalent. The qualitative data reported in this paper were obtained from a large randomized control efficacy trial conducted across 64 schools in England. This impact evaluation found no evidence that mathematics intervention had an impact at the end of primary school mathematics assessments (i.e., key stage 2) compared to business-as-usual teaching and support (see Torgerson, Ainsworth, Buckley, Hampden-Thompson, Hewitt, Humphry, et al., 2016). However, as part of the trial, a large amount of qualitative data focusing on the nature of the pupil–tutor relationship and the emotions of the pupils as they participated in online tuition were collected. It is these data that we report on in this paper.

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### 1.1. Online learning environments

Online one-to-one tuition is a form of pedagogy based on communication between pupils and tutors. As such, interpersonal relationships lie at the heart of the effectiveness of this form of learning. Our study focuses on how the pupils' emotional experiences of the pupil–tutor interpersonal relationship in the online environment impact their *processes* of engagement with their learning (e.g., Hastie et al., 2007; Johnson & Bratt, 2009; Jopling, 2012; Price et al., 2007) rather than focusing on cognitive outcomes. Many of the existing studies emphasize the importance of the pupil–tutor interaction for supporting learning (e.g., Bryde, 2001; Johnson & Bratt, 2009; Kopp, Matteucci, & Tomasetta, 2012; Richardson, 2009), including the pastoral care, counselling, and mentoring of pupils (Jopling, 2012; Price et al., 2007). Research on the emotions involved in online learning environments also contributes to knowledge on interpersonal relationships in achievement and academic OLEs (Borup et al., 2012). However, few of these studies involved an in-depth investigation of the pupils' emotional experiences of their interactions with their tutors, which this study does (for an exception, see Hastie et al., 2007).

The particular form of online one-to-one tuition we researched was delivered via a web-platform using a range of synchronous visual and audio communication tools, including interactive shared screens and whiteboards, an instant pupil-tutor messaging service and headsets that allowed the pupil and tutor to communicate using speakers and earphones. The central mode of communication was synchronous one-to-one *audio conferencing* dialogue via headsets between the pupil and the tutor throughout the sessions. As such, a key focus of our research was to examine how the pupils' emotional experiences and interactions with their tutors were shaped by the audio-led technology mediating communication, which relied on verbal communication without para-linguistic cues (i.e., without visual clues, such as gestures and facial expressions).<sup>2</sup>

Historically, *asynchronous* modes of online communication (e.g., email and discussions boards) were initially incorporated into teaching and learning practices. However, in the past decade, *synchronous* modes of communication have started to be increasingly used in OLEs, and researchers have investigated their particular benefits, potential, and challenges (Hastie et al., 2007; Jones & Gallen, 2015; Kear et al., 2012; Macdonald & Campbell, 2012; Price et al., 2007). Synchronous modes are argued to avoid some of the pitfalls of poor communication and misunderstandings between pupil and tutor that are found with asynchronous approaches and to better facilitate pupil–tutor interaction and collaboration, enabling an improved sense of “social presence” (i.e., sense of communicating with a “real” person), which is associated with improved learning experiences (Borup et al., 2012; Hastie et al., 2007; Kear, 2010; Kear et al., 2012). Our study adds detailed information to these debates through its analysis of primary empirical data examining how pupils emotionally experience audio-led synchronous one-to-one tuition. Furthermore, we apply social presence theory (Short, Williams, & Christie, 1976) to our research in order to advance the understanding of this theory in the context of OLEs.

### 1.2. Pupils' emotions and online learning environments

There has been increasing attention placed on emotions in education research and their inter-relations with learners' engagement and achievements (Gray, 2002; Gilmore & Warren, 2007; Matteson, 2014; Morales, 2008; Noddings, 2012; Pekrun, 2006; Reay, 2015; Scrimin, Altoe, Moscardino, Pastore, & Mason, 2016; Williford & Wolcott, 2015). This body of research has also turned its attention to pupils' emotions and OLEs (Artino, 2012; Borup et al., 2012; Cho & Heron, 2015; Daniels & Stupnisky, 2012; Järvenoja & Järvelä, 2005) and the emotions derived from interpersonal relationships in OLEs (Borup et al., 2012; McGarrah Sharp & Morris, 2014). For example, the long standing research of Hanna Järvenoja and Sanna Järvelä has explored the interplay between cognitive, motivational, and emotional aspects of learning focusing primarily on technology-based collaborative learning contexts (see Järvenoja & Järvelä, 2005; Järvenoja & Järvelä, 2009; Järvelä & Järvenoja, 2011).

Artino (2012) and other authors reporting empirical research on emotions in OLEs for the *Internet and Higher Education* Special Issue 15(3) argue that emotions recognized as important in the traditional academic and achievement spaces of face-to-face classrooms also have an important impact in OLEs. Their research focuses on “achievement emotions” (Artino, 2012, p. 137) and the connection between emotions, the learning process, and achievements. However, we also attend to “achievement emotions”: both “activity-related” emotions, such as enjoyment, frustration, and boredom, as pupils engage in the learning process and “outcome emotions” associated with success and failure, such as pride, anxiety, embarrassment, and anger (Pekrun, 2006, p. 315). To address our research aim of investigating pupils' emotional experiences of online mathematics one-to-one tutoring intervention, we considered emotions to be embodied, social, dynamic, and relational (Pekrun, 2006; Smith & Bondi, 2009; Webb, 2012), and thus not immanent in the pupils, but arising dynamically from their interaction with their tutors.

As far back as 1964, philosopher John Macmurray described teaching as “one of the foremost personal relations” (p. 17). In this context, we are interested in whether pastoral care can be part of online interpersonal relationships. Noddings' theory of care ethics emphasises the importance of the pastoral element of pupil–teacher relationships, which requires “establishing and maintaining relations of care and trust” (2012:771). Price et al. (2007) research with adult Open University distance learners found limited pastoral care during one-to-one online tuition compared to face-to-face learning (p. 16). McGarrah Sharp and Morris (2014) designed and evaluated an online course in pastoral care for nurses and, although it was a group-based practice that was largely asynchronous, they argued that there were opportunities for virtual empathy and authentic connections online. These contradictory reports suggest there is more to understand about the emotions and interpersonal relationships in OLEs.

<sup>2</sup> Video was not used on the online platform mainly because schools tend not to be well equipped to accommodate the use of video conferencing. As we go on to discuss later in the paper, there were technical challenges that faced the schools and impacted the pupil experience.

Critics emphasize that not only is online learning different from face-to-face learning, but that the distinctions between the different technologies used for online learning need to be better understood (Jopling, 2012; Okdie, Guadagno, Bernieri, Geers, & McLarney-Vesotski, 2011; Sprecher, 2014), which this paper explores. We also consider the notion of “digital Taylorism” (Peters & Bulut, 2011), which refers to formerly skilled knowledge work becoming standardized through technological media. We are interested in how pupils experience the potential contradictions of engaging with an intervention that aims to offer an *individualized and interpersonal* tuition service but delivered it via a *standardized* platform.

Finally, relevant to analyzing the pupils' emotional responses is the concept of social presence (SP), which refers to the online users' perceptions of each other as real people (Short et al., 1976). Critics argue that social presence has an impact on communication, capacities to participate, and feelings of connection and satisfaction, which are all directly connected to emotional experience (Gunawardena & Zittle, 1997; Hastie et al., 2007; Kear, 2010). Short et al. (1976, p. 65) developed social presence theory (SPT) to explain how the degree of salience of the other person during interactions affected the quality of their interpersonal relationship. For the purpose of our study, a useful refinement of this concept is offered by Gunawardena (1995), who refers to SPT as “the degree to which a person is perceived as a ‘real person’ in mediated communication” (p. 151). In a summary of the findings of SPT research over the years, Homer, Plass, and Blake (2008) indicated that information is better remembered by learners when it is presented in a manner that increases social presence. Furthermore, social presence is regarded as being influenced by the *type* of communication medium used. Text-based mediated communication is generally regarded as having low social presence because it is devoid of intimacy in terms of physical distance, eye contact, facial expressions, and other non-verbal cues (Short et al., 1976), whilst synchronous and visual elements are regarded as offering improved communication and social presence than asynchronous computer-mediated communication (CMC) (Hastie et al., 2007; Kear, 2010; Kear et al., 2012).

### 1.3. Purpose of this study

The primary purpose of this study was to investigate primary school pupils' emotional experiences of one-to-one online mathematics tuition interventions. In particular, we looked to address the following two research questions.

1. What emotions did pupils experience during the delivery of the online tuition?
2. How were the pupils' emotional experiences of the pupil–tutor interpersonal relationship affected by the synchronous audio-led online learning environment?

## 2. Methodology

### 2.1. Context

The findings reported here are obtained from a qualitative process evaluation of a large-scale randomized control trial involving 64 primary schools. For this trial, each participating school was asked to identify eight pupils and three reserves who were in Year 6 of their schooling (aged approximately between 9 and 10 years old) and, based on prior attainments, were considered to be not on-track to achieve national standards in mathematics (i.e., below level 4 in Key Stage 2 assessments). After the pupils were selected, the schools were randomly categorized as 32 intervention schools and 32 control schools. In the 2014–15 academic year, each pupil in each of the intervention schools was engaged in online tuition once a week for 27 weeks from September 2014 to May 2, 2015.<sup>3</sup> In total, 578 pupils participated in the study, with half of those receiving the intervention.

The online one-to-one tuition program was delivered by a UK developer, called Third Space Learning (TSL), supported by Nesta (a learning and innovation centre), funded by The Education Endowment Foundation, and evaluated by the University of York and Durham University (Torgerson et al., 2016). The program, which was delivered as an intervention over 27 weeks in one school year, consisted of weekly 45-min one-to-one mathematics sessions conducted via a secure online classroom, normally during the school day. The sessions were designed to support classroom teaching, with class teachers able to select lessons from TSL's mathematics curriculum to target individuals' learning gaps identified during class lessons. Thus, the intervention supported in-school teaching strategies.

Tutors and pupils worked through the online lessons by communicating via talking, drawing and typing, using a shared interactive screen and headsets to talk in real time.<sup>4</sup> The platform included structured interactive lessons into which the pupils could input their responses to maths problems, and tables, graphs, diagrams, stickers and virtual rewards were used to further engage the pupils. A messaging service for typing and receiving instant messages was provided, and whiteboards for pupils to write and draw freestyle responses. However, the key focus was on students solving math problems by talking through their processes and explaining their reasoning, hence this study emphasises the audio aspect of the pupil-tutor interactions.<sup>5</sup>

TSL regards their program to be affordable because they are able to reduce costs by recruiting mathematics graduates from India

<sup>3</sup> For more information on the design of the trial and the recruitment process, please refer to Torgerson et al. (2016).

<sup>4</sup> The intervention was delivered one-to-one by the tutor to the pupil and while some tutoring programs are delivered in small groups this was not the case with this trial.

<sup>5</sup> See ‘Watch it in Action’ and ‘How it Works’ videos on TSL website <https://thirdspacelearning.com/> and <https://thirdspacelearning.com/how-it-works/> accessed 17/12/18.

and Sri Lanka, where labour is cheaper than that in the United Kingdom and in high supply. For the 27 week program the cost was £378 per pupil. TSL trains the graduates to be online teachers, who then use technology via the TSL website learning platform to connect with pupils in the UK. This tutoring support can be integrated into the school timetable, and collaborative monitoring of the pupils' progress and intervention delivery occurs throughout the program between the Asian tutors, TSL, and the relevant school staff.

TSL work closely with the Institute of Education (University College London) to provide training for all their tutors. The focus is largely on communication and cultural training, promoting a holistic pedagogy based on encouragement and interacting with learners to foster their confidence and engagement. This includes attention to tone of voice and rehearsing potential scenarios through role-play. At the time of conducting this research, TSL were in the process of setting up their own training centre in Sri Lanka, working towards the majority of their tutors being in full-time employment, providing ongoing personalized professional development and improving retention. For consistency purposes, the intention was that the pupil would have the same tutor throughout the 27-week program. While that was the case for most students in the trial, some pupils did experience a change in tutor due to unforeseen circumstances such as a tutor leaving employment. It should also be noted that our research indicated that some pupils had been told where their tutors were based (i.e., India or Sri Lanka). However, we found that this was not universally known or understood by all pupils in the trial.

## 2.2. Data sources

Our findings draw on the data collected for the process evaluation of the trial. The main purpose of this process evaluation was to understand the details of the implementation of the intervention and the stakeholders' perceptions, to identify elements of successful delivery, and to inform appropriate modifications for future use. Early on during the data collection process, we found that pupils were describing their experiences of the intervention through an emotional lens. As such, the emotional element of the delivery of these online one-to-one tuition interventions became the focus of the subsequent case study data collection.

A mixed-methods design was used, involving interviews and focus groups in seven case study schools. We also conducted three semi-structured interviews with the delivery partners (TSL and Nesta).<sup>6</sup> The case study schools engaged in the trial intervention were selected based primarily on secondary compliance data, which were collected and supplied by TSL. These secondary data included information on missed sessions, pupil engagement, feedback from tutors and pupils, and technical information (e.g., login and log-off times). The case study schools represented a range of typologies in terms of the amount and type of problems experienced, as reported in the secondary data. Across the seven schools, nine focus groups were assembled, involving 55 pupils, and 16 in-depth semi-structured interviews were conducted with school staff delivering the intervention. The pupils were all year 6 pupils (10 or 11 years of age) who attended state funded primary schools that had been recruited to participate in the mathematics tutoring trial. The pupils were deemed by their schools to be performing below the required standard in mathematics which was level 4 at key stage 2. The focus groups were a mix of males and females with slightly more of those who participated in the focus groups being female. The focus group sizes ranged from six to eight pupils.

We drew on the views of school staff, such as classroom teachers, maths co-ordinators and teaching assistants, who mediated the online tuition, to help us understand their role in facilitating this relationship, and their perceptions of the pupil-tutor interactions. This mediating role has not been addressed in prior studies, partly because other online tuition or distance learning models (such as the Open University model) do not have the same three-way structure (teacher-tutor-pupil) as the TSL program. Three additional interviews with the school staff from two further intervention schools were conducted via telephone.

Focus groups were deemed the most appropriate method of collecting data as we were interested in both the individual pupil accounts of their experience but also how others responded their accounts (Greene & Hogan, 2005). Furthermore, pupils are likely to view an adult interviewer in a one-on-one interview as an authority figure and feel a need to please the interviewer or express the "right" opinion. Focus groups allow pupils to interact with and react to one another, which helps mitigate the authoritative nature of an adult-child interview. It takes the pressure of responding away from a single pupil and provides additional data about how pupils respond to their peers (Heary & Hennessy, 2002).

## 2.3. Data analysis

We conducted a thematic analysis to identify commonalities, differences, and key trends across the data, using deductive and inductive approaches. The importance of the tutor-pupil emotional social interactions emerged from an inductive analysis, particularly from the pupils' narratives, in which this theme was discussed in all nine focus groups, and also from many of the staff interviews. We therefore developed this issue as a question for subsequent interviews with the delivery partners, which then shaped the research questions of this paper.

## 3. Results

### 3.1. Developers' perspective on emotions

In our interviews with them, the TSL developers expressed some sensitivity to the pupils' emotional experience of the intervention

<sup>6</sup> For a full description of the process evaluation methodology and supporting documentation, see Torgerson et al. (2016).

in that they stressed the importance of developing a holistic program to foster the pupils' self-confidence as a crucial element for fostering engagement with the learning process. This is an approach that they are keen to develop and that they explicitly integrate into their teacher training. They had implemented some strategies and systems to improve the interaction and personalization of the one-to-one online tuition service, which we discuss later. However, as a start-up, the TSL developers explained that they were prioritizing “the basics first,” such as curriculum design, so they did not have an advanced understanding of the emotional context of the pupil–tutor interaction in these early stages. In fact, the Nesta manager speculated that some pupils may find that the online nature of the intervention reduces the social pressure involved in interacting with their tutors, and that there is “some separation there that takes some of the social aspects out of the interaction.”

### 3.2. Overview of the pupils' emotions

With reference to the overall aim of the study, which was to investigate the pupils' emotional experiences of the one-to-one online tuition intervention, we found that all the pupil focus groups across all the case study schools included emotionally charged narratives. Pupils' emotions were varied, as they reported feelings of happiness, excitement, and increased self-esteem, but also feelings of anxiety, fear, anger, and distress. Many school staff members also discussed the pupils' diverse emotional responses, with some pupils looking forward to the sessions and gaining self-confidence whilst others became upset when they felt their tutors had been angry or impatient. Commonly, a pupil would experience both positive and negative emotions at different times, as expressed by one child who said, “I felt a bit happy and a bit not” (pupil focus group, school 4).

Some of the emotions experienced by pupils were akin to those that would be expected during face-to-face learning. For example, pupils reported feeling stressed when encountering challenging mathematics problems or anxious about being perceived as not intelligent enough. Others felt pleased when they succeeded and many enjoyed the personal attention of one-to-one tutoring. Tutoring in itself was a new experience for most of the pupils, and several pupils said they felt more comfortable participating without the fear of being exposed and ridiculed by their peers in the classroom if they made mistakes. This was especially important for pupils who had been selected for the intervention because they were struggling with attainment levels.

Despite a significant number of pupils saying that they felt bored or that they disliked the intervention, both pupils and staff reported improvement in the pupils' self-confidence in their mathematical abilities. For example, one staff member described a pupil who disliked the direct attention of a tutor, preferring the anonymity of classroom teaching. Nevertheless, the tutoring had improved this pupil's self-confidence and verbal participation in the classroom,

Talking one-on-one to an adult for an hour about mathematics, about something they don't feel particularly good at, is a challenging situation ... (but) on the whole it was generally positive. Even those children who didn't enjoy those sessions as much still grew academically; I think they took what they knew and contributed that more to the class (mathematics coordinator, school 8).

Please refer to [Table 1](#) for a summary of the key findings.

### 3.3. Pupil–tutor relationship

With reference to the first research question of investigating how pupils' emotional experiences were shaped by the online pupil–tutor interactions, pupils reported a spectrum of emotions, depending, for example, on whether they felt their tutor to be sympathetic and encouraging or alternatively authoritarian and aggressive. Irrespective of their response, it is clear that the relationship between the pupils' emotional experiences and their learning was mediated by the tutor–pupil relationships.

Positive feedback, patience, and empathy were crucially important. In these cases where these were present, the pupils felt supported and encouraged to persist, which could build high levels of self-confidence, resilience, and ultimately achievement. In cases in which pupils had good relationships with their tutors, they reported both positive emotional experiences and improved academic outcomes. For example, one pupil reported their experience as being,

very nice because if you got something wrong she'd ask if I needed help or not ... and she helped me to work it out properly, which made me feel very happy that I've got someone there beside me to help me get through it. (pupil focus group, school 4)

The tutor's response when a pupil got something wrong was crucial because of its impact on self-esteem, which was potentially an issue for pupils who were not on-track to achieve national standards. Thus, in negative cases in which pupils had poor relationships with their tutors, they experienced negative emotions, adversely affecting pedagogic engagement. For example, one pupil reported,

(they) raise their voice ... I don't know how to do it and they say ‘come on’, and I got bored of it and I don't like that tutor ... and I just sat there (pupil focus group, school 7).

A number of pupils across most of the schools expressed various negative emotions in relation to their tutors, complaining that their tutors did not listen, interrupted them, pushed them too hard when they did not understand, or responded impatiently when they were stuck on a problem. Thus, the pupils responded in differing emotional ways according to differing tutor personalities and teaching styles.

We observed, however, that pupils' anxiety about communicating to their tutors lessened over time as the tutors became more familiar. This replicates face-to-face learning experiences to some extent, as one teacher pointed out,

(They) became more positive ... At the beginning they didn't know the person on the other end; that was a big problem. It's like

**Table 1**

Summary of key findings by research question, themes, influencing factors and emotions.

Research question	Themes	Influencers	Emotions			
			Activity-related		Outcome-related	
			Favourable	Unfavourable	Favourable	Unfavourable
One	Role of pupil–tutor relationship	Poor relationships with tutors, perceived as unsympathetic, impatient, angry, authoritarian		Dislike for tutors Feelings of failure Boredom Distress Anxiety Anger		Feeling unsupported
		Positive relationships with tutors, perceived as empathetic, encouraging, patient	Feeling supported Self-confidence Happiness Enjoyment Self-confidence		Feeling supported even when making mistakes	
		One-to-one: personal attention	Enjoyment Self-confidence	Discomfort		
		One-to-one: no peers	Alleviated stress Self-confidence		Self-confidence even when making mistakes	
Two	Pastoral care	Pupils with challenging emotional problems		Distress		Low confidence
	Role of technology	Online tutoring new experience	Excitement Anticipation			
		Perception of “stranger danger” as not face-to-face		Nervousness Anxiety Fear Apprehension Shock Shyness		
		Instant messaging technology created social distance (low social presence)	Alleviated stress			
		Pupil autonomy input (e.g., choosing own rewards)	Enjoyment			
		Rewards			Enjoyment Pride	Discomfort if rewards inappropriate Disappointment and jealousy if fewer points than other pupils
	Role of dialogue	Increased sensitivity to positive/negative voice registers	Feeling supported Happy	Feeling unsupported Distress Anger Anxiety Distress		
		Pupils asked personal questions				

supply teachers. They don't respond well to supply teachers because they don't know them (teacher, school 4).

This reminds us that both online and offline relationships can be distant and unfamiliar, characterized variedly by trust or anxiety.

### 3.4. Pastoral care

Pastoral care is one of the responsibilities of being a teacher, and in our study, several staff members commented on the limitations of the pupil–tutor interpersonal relationship in this respect. Various reasons were given, including the time-limited duration and infrequency of the intervention giving little time to develop authentic understandings and the limitations of the online mode of communication in terms of developing genuine “real” relationships between “real” individuals. However, barriers to more empathetic relationships were also due to the teaching styles and personalities of particular tutors, some of whom were reported by both teachers and pupils as authoritarian and insufficiently sympathetic. TSL noted the cultural differences in pedagogic style between UK and Indian/Sri Lankan teaching, with the latter being traditionally more authoritarian. Whilst the TSL cultural training with their tutors to foster sensitivity, empathy and positive feedback was evident in many cases, nevertheless in most case study schools there were one or more pupils who experienced negative emotions whilst interacting with their tutors. Several staff members re-iterated this, particularly where pupils had challenging emotional issues. For example, one teacher explained that her intervention group already

had challenging social and emotional issues at home, including having experienced the loss of several school teachers over the year,

It wasn't the program for them because they have very specific needs, and they seem to only work well with people they know. Because they'd had a year of rejection, because they'd had a lot of different teachers and they'd had some quite negative teachers really, they're very defensive in their behavior ... I think a little bit of where (the program) fell down is that the tutors' relationships with the children weren't always as strong as they could be (teacher, school 4).

It was difficult to determine which of the pupils' emotions emerged in response to the online element of the tutoring experience and which were simply generated by the dynamics of teaching or tuition per se. However, we did identify that pupils experienced certain emotions specifically because of the online context. Therefore, in the next section, we focus on the second research question, which is investigating how pupils' emotions are shaped by the audio-led synchronous online tuition.

### 3.5. Audio-led synchronous online tuition

With reference to our second research question, which is how pupils' emotions are shaped by the audio-led synchronous online tuition, the pupils commonly reported that simply knowing that they were going to be doing an intervention involving online communication generated feelings of anxiety or excitement, and often both. Many pupils expressed nervousness and fear about talking to an unknown and unseen tutor, particularly at the start of the intervention. Several pupils described the online tuition experience as "strange" and, "unusual ... we haven't ever done something like this," explaining that they felt nervous,

because you don't see their face ... you don't know them and all you can hear is their voice. (pupil focus group, school 5)

Thus, it was precisely because tutors' social presence was weak that the pupils' emotions were strong. Some described intense embodied emotional responses, such as feeling "shocked and nervous," when told that they would be talking to a tutor online. The following exchange between pupils articulates this:

Then sometimes your heart beats ... because I was nervous.

Faster and faster.

That happened to me, because like they were people that we don't know.

(pupils focus group, school 3).

Several school staff members across the schools also commented on pupils who had difficulty relating to their tutors because they did not know and could not see them. This contradicts the Nesta manager's view that online interaction reduced social presence and therefore reduced social stress. Whilst some pupils were unfazed by the sense of distance from their tutors, this was often not the case.

For those pupils who did have anxieties about their tutors, this seemed to be exacerbated by the absence of names and a visual image of the tutors. Pupils across all of the schools said that they would have liked to have seen photographs or videos of their tutors. Several pupils reported feeling uncomfortable with not knowing their tutors' names, who instead "just have numbers." As one child articulated,

You know it's like someone that helps you with mathematics but you don't know their name or nothing, like their identity (pupil focus group, school 5).

Several pupils related their anxiety about online relationships to the concept of "stranger-danger." One pupil said, "It feels like stranger-danger," and another, "You never know who they are, they could be a kidnapper for all you know." TSL takes safeguarding very seriously, so "stranger-danger" is a perception by the children, not a genuine threat. However, the program operates within a UK culture that commonly deploys a "stranger-danger" discourse, as noted by several staff members, and this was transferred to the online context. As one member of staff described,

One child walked out of the room several times, he just could not handle talking to a stranger online ... and that's probably because we've pounded into them 'Don't talk to strangers ... don't give people online your details ... ' and then to put them in that situation (mathematics coordinator, school 4).

However, just as the pupils became increasingly familiar with their tutors, most also "got used to" the online mode of communication. For example, the pupil who walked out, later re-engaged successfully,

He actually came out as one of the best reacting to the one-to-one intervention ... For him (it was) quite major to get him out of his shell with anybody ... It had a very positive effect on his confidence ... I think he's not afraid to give answers now, he's not so closed in on himself (teacher, school 4).

However, the dynamic changes in the emotional responses over time were not predictable and ranged from pupils who became more engaged and self-confident to others who had initially enjoyed the novelty of the online learning program but later became "bored" and disengaged.



### 3.6. Role of dialogue in audio-led interventions

All the various elements discussed in relation to the pupil–tutor interactions—emotionally positive attitudes to learning, the fostering of emotionally positive relationships, and the development of care and trust—depended on the dialogue between the pupils and tutors, and this is at the heart of the *audio-led* intervention. The key aim of the audio-led intervention, as iterated by the program developers, is to get the pupils *talking* through their mathematics, and we found that examining the dialogue between pupils and tutors central to understanding pupils' emotional experiences.

Overall, the school staff felt that the dialogic element of the intervention was positive and engaged the pupils. Several staff members compared the talking aspect of the intervention favorably with classroom teaching, reporting that, by verbalizing their mathematics problems, the children's verbal fluency and reasoning improved, sometimes with the knock-on effect of increased verbal participation in class. Staff members who sat in the virtual classroom during the sessions (session administrators) could listen to the pupil's side of the conversation and occasionally moved in close enough to hear the tutors at the other end. By drawing on these close observations, they unanimously reported positively on the extent and tone of the pupil–tutor dialogue and that the pupils were for the most part well engaged. They observed the pupils talking and asking questions throughout, even those who were less forthcoming in the classroom.

However, as described above, some negative or conflictual exchanges between pupils and tutors were observed and reported by staff and pupils, with pupils at times feeling upset or angry in response to perceived rudeness or aggression from the tutors. Several pupils refused to talk to their tutors, owing to the “stranger danger” factor described above, because they disliked the internet audio mode of communication, or simply because they disliked the pressure of talking *per se*. Each school had at least one pupil reporting unease or anxiety about talking to the tutors. As one staff member said, “(some children) are just not comfortable with the speaking element of it.” There were mixed reports from staff as to which pupils they thought suited the dialogic program. Some staff members said that the more reserved and socially unconfident children struggled with the focused one-to-one interaction, whilst other staff members felt that it could draw the shyer children out.

With the audio-led program's absence of para-linguistic cues, the pupils were attuned to the tone of voice and even subtle registers. Several pupils found their tutors' vocal responses off-putting, for example,

Basically, my tutor, when I get things wrong because I don't understand what I'm doing, she starts to go like ‘ahh ummm’. It's really awkward and a little bit rude to me (pupil focus group, school 1).

If you tell them you don't know it, my tutor—*sigh*—she's like that (pupil focus group, school 1).

The tutors' tone of voice, however, could also be encouraging, and overall, the pupils reported sensitivity to a range of voice registers, such as empathetic, aggressive, encouraging, or impatient.

The pupils were most nervous about talking to their tutors at the beginning of the program, and the alternative text technology of instant messaging, which was embedded into the web platform, helped in this situation. Whilst the pupils displayed some frustration with the slow speed of the instant messaging, it enabled them to communicate with their tutors until they felt confident enough to engage in verbal conversation. For some pupils, the instant messaging seemed to provide the social distance and alleviation of social stress that the Nesta manager had credited to the one-to-one online tuition medium more generally. The messaging was also essential when the audio-technology failed. As one teacher pointed out, the dialogue was only as good as the audio connection and, mundane as it is, technological unreliability undermined the quality of the verbal dialogue. This also had an emotional impact as pupils felt frustrated or upset when the audio connection was poor and they could not hear their tutors adequately.

## 4. Discussion

First, we will discuss the overall research aim, which was to investigate primary school pupils' emotional experiences of synchronous audio-led online one-to-one tuition. Then, we will address the two research questions in turn, examining how pupils' emotions are shaped by the pupil–tutor relationships and how pupils' emotions are shaped by the synchronous audio-led mode of online learning. Finally, we will discuss how the intervention can be improved.

There is a danger associated with virtual online disembodied services in that embodied emotions are insufficiently acknowledged, as was indicated by the Nesta manager's misconception that online interactions were likely to be less socially and emotionally demanding. However, we found that pupils' emotional responses were often strongly felt. They varied and were fluid and contradictory (Bondi, 2005), contingently shaped, for example, by experiences of achievement or failure, anxieties about interacting with “strangers” online, or tutors' teaching styles.

This research therefore corroborates existing research (Artino, 2012; Daniels & Stupnisky, 2012) by indicating that emotions are as important to consider for online learning as for traditional face-to-face learning. Some of the issues found were common to both online and offline learning environments, such as the unfamiliarity of new teachers, anxieties about giving correct answers, and wanting approval. There were positive emotions linked to the one-to-one element of tuition intervention, as pupils across the board were reported to have gained self-confidence in their mathematics, with many engaging well with the dialogue, becoming more willing to engage and speak even in the classroom, and even for those pupils who did not enjoy the intervention. This extends existing research, which recognizes that negative emotions can nevertheless produce positive academic outcomes (Artino & Jones, 2012; Pekrun, 2006).

Our first research question allowed us to examine how pupils' emotions are shaped by the pupil–tutor relationship. One-to-one



online tuition is a personalized type of pedagogy to meet pupils' individual learning needs and is thus regarded as an excellent means to meet differentiated learning needs. However, our findings indicate that the online one-to-one online tuition intervention that we researched currently struggles to meet students' differentiated emotional needs.

The pupils experienced a range of emotions when interacting with their tutors, from happiness and excitement to anger and distress, which influenced their engagement and learning experiences. Hence the “achievement emotions,” defined by Pekrun (2006) and extended into the analysis of emotions in OLEs in the special issue of *The Internet and Higher Education* edited by Anthony Artino (2012), were not only present in our study, but were often shaped by the pupil–tutor interactions. For example, pupils often became excited or frustrated whilst engaging in the learning processes (the “activity-related” emotions) in response to their tutors' encouragement or impatience, i.e. the tutors' emotions are important in the interactive process. Pupils' “outcome emotions,” generated in response to successes and mistakes, were also mediated by their tutors' responses. Thus, “failures” could lead to either positive emotions, such as, “very nice because if you got something wrong ... she helped me to work it out properly, which made me feel very happy”; or to negative feelings, such as, “I don't know how to do it and they say ‘come on’, and I got bored.” This highlights the importance of the pupil–tutor interaction for mediating the “achievement emotions.”

The tutors' capacities for dealing with pupils' emotions varied, but even in cases where the tutors were encouraging and sympathetic, the online relationships did seem limited in terms of generating deeper interpersonal relationships. Pastoral care was clearly a difficult objective for a weekly 45-min intervention over 27 weeks, particularly in challenging situations where pupils were already experiencing emotional difficulties at home or school. However, as McGarrah & Morris (2014, p. 523) suggest, learners' emotions need to be understood in terms of the particular online technology being used, which we discuss next.

Our second research question investigated how pupils' emotions are shaped by the audio-led synchronous online one-to-one tuition. Dialogue is important in any pupil–teacher relationship (Noddings, 2012) but, as discussed, it is crucial to the success of the audio-led synchronous online tuition program. On the plus side, the extent of the pupils' side of the dialogue indicates that the pupils were, on the whole, sufficiently comfortable with the tutors to express themselves freely. This echoes Hastie et al. (2007) research, which found synchronous one-to-one online tuition engendered higher levels of interaction and collaboration between 5-to-8-year-old learners and their tutors and increased concentration and work rates, compared to asynchronous modes of self-paced learning. However, on the minus side, the audio-led mode of communication removed from the pupils any visual sense of who they were engaging with, which seemed to be a barrier to more empathetic and trust-oriented relationships. The pupils in our study expressed a desire to have images of their tutors, which echoes other studies that have stressed the importance of both asynchronous and synchronous video (Borup et al., 2012; Johnson & Bratt, 2009; Kear et al., 2012; Nichol & Watson, 2000) to enhance and build online relationships more quickly.

Related to this are arguments about social presence, which refers to the sense of a “real” person in mediated communication (Gunawardena, 1995), whereby it is generally argued that synchronous online technologies generate a stronger sense of social presence than asynchronous ones. Previous empirical research supports this view, evidencing significant and positive relationships during synchronous online tutoring (Bryde, 2001; Johnson & Bratt, 2009). Video-conferencing in particular has been highlighted as offering high social presence because participants can see each other in real time, but hearing each other's voices during synchronous communication has also been found to increase social presence (Kear, 2010). This has led to the argument that social presence helps address the challenges of conducting interpersonal relationships online across the spatial and/or temporal distances of virtual space, leading to improved learning experiences (Borup et al., 2012; Kear, 2010). This argument thus supports the dominant view that social presence is positive and a benefit to both the communication and pedagogic experiences of learners.

In our study, we found that many pupils did experience a reasonably strong sense of social presence due to the synchronous technology, which corroborates existing research, but we argue that this sense of connection to a “real” person *cannot be assumed to be positive*. Some researchers have noted that not only the technology but also online participants' behaviors, such as effort and sensitivity, play a role in the extent and benefits of social presence (Kear, 2010). Nevertheless, social presence is generally accepted as an interpersonal benefit, and the negatives of social presence are not explored. Our research, however, provided a much more nuanced evaluation of social presence, including considering the negatives of strong social presence, as well as the benefits of weak social presence.

Most pupils in our study commented on their tutors' personalities and the emotional tenor of their interaction with them, including expressions of like and dislike for particular tutors, indicating that they were well aware of them as “real” people. In other words, they had a strong and *emotionally sensitive* sense of their tutors' various and different social presences. This included strong responses to tutors' tones of voice and picking up on subtle vocal registers. However, this sense of social presence did not always enhance the pupil–tutor interactions or the learning experiences. The range of voice registers conjured a range of social presences, which could be variously empathetic and encouraging, or impatient and aggressive. Not only was the impact of social presence not always a benefit, but it could actually have a detrimental effect. For example, whilst praise led to positive engagement, negative feedback had the reverse effect.

Low levels of social presence, however, could also have a strong emotional impact. Existing research generally argues that low social presence equates with low levels of communication and engagement, which can lead to misunderstandings or poor academic outcomes (Gunawardena & Zittle, 1997; Hastie et al., 2007; Homer et al., 2008; Kear, 2010). Our research also found that low social presence could lead to low levels of interpersonal connection and pedagogic engagement, as demonstrated by the pupils' who felt nervous about communicating with online “strangers,” which corroborates existing views. However, our study goes further by arguing that low social presence may not simply be a barrier to communication and learning, but can actually produce strong negative emotional effects. McGarrah Sharp & Morris (2014) study of student nurses engaged in an online pastoral care course noted that many felt anxious prior to the online intervention. This is reiterated in our study, which found that pupils' anxiety levels could be

extreme, both prior to and during the early stages of the intervention. The pupils' fear of "stranger-danger" was an explicit articulation of anxiety about low social presence. Thus, rather than weak social presence leading to an anxiety-free social disconnect, as suggested by the Nesta manager, or simply disengagement, as suggested in most of the literature, instead it could generate strong emotions, with students feeling "shocked" and "nervous," unable to speak to their tutors, and sometimes even leaving the room.

Whilst some pupils did "get used to" the online interactions and over time felt more comfortable with their tutors, for others the feelings of insufficient connection to their tutors persisted. However, there was not always a strong or developed-enough sense of social presence to deal with the full range of pupils' emotional and pastoral needs, particularly in the case of students with already-existing emotional problems at school or at home. This accords with other studies that have also found that insufficient social presence can impact tutors' abilities to provide pastoral care for pupils, which plays a crucial part in mediating pupils' emotions and fostering positive attitudes toward learning (Jopling, 2012; Price et al., 2007).

Lastly, we found that whilst tools such as online messaging did lead to lower levels of social presence, this could in fact enhance the learners' emotional experiences. Some pupils used messaging, particularly in the early weeks of the intervention, explicitly to provide social distance and alleviate social stress compared to the more intense synchronous audio-interaction. Thus, the addition of a text-based technology integrated into the platform is a useful addition for pupils who find the synchronous dialogue with an unseen and unknown stranger challenging. In such cases, the weaker social presence of the text-based communication, with lower levels of social stress, can act as a bridge or stepping stone towards the more "real" interaction of synchronous tutor–pupil dialogue, giving the pupils time to get used to what for most of them was an unusual ("strange") form of communication.

Overall, we have developed and nuanced social presence theory, arguing that social presence needs to be understood to be as complex, changeable, and varied as face-to-face embodied presence, both potentially negative or positive: distant and "strange," or empathetic and supportive.

#### 4.1. Intervention improvements

Despite the limitations of the intervention discussed so far, we argue there is potential for a more personalized and emotionally sensitive delivery of synchronous one-to-one online tuition. Our findings clearly indicate that some improvements could be made in the intervention's design, and overall we argue that a more authentic personalized learning experience can be achieved by developing a more collaborative model, as suggested by several authors in regard to online learning (Jopling, 2012; Kear, 2010; McGarrah Sharp & Morris, 2014). Our findings indicate that pupils' access to tutors' names, as well as images and contextual information, would reduce anxiety and positively increase social presence, as also found by Hastie et al. (2007). However, as we have argued, higher levels of social presence do not necessarily equate with improved pupil–tutor relationships. Therefore, to facilitate increased social presence and the pupil–tutor relationships in positive ways, we need to dig deeper. The crucial finding in this respect was that the pupils desired more autonomy and collaboration, as highlighted in respect to positive pedagogic outcomes in previous studies (Jopling, 2012; Williford & Wolcott, 2015). As the pupils themselves suggested, the processes could be improved by enabling them to participate in setting the learning objectives and choose their own rewards, based on personalized profiles they had filled in themselves.

Our findings revealed that many pupils enjoyed and were motivated by rewards, such as pictures and games, which were integrated into the program. However, the fact that the knowledge shaping of the rewards came from pupil profiles generated by the staff, rather than generated by the pupils themselves, meant that this strategy could backfire. In the absence of pupils imparting their own personal information, the rewards could exacerbate the pupils' sense of "stranger-danger," as they were neither in control nor cognizant of how the tutors had accessed their personal information. Kear (2010), drawing on a literature review of social presence and interviews with Open University students engaged in online learning, argues that creating participant profiles is key to improving social presence and enhance communication and the learning experience. However, to achieve this, we emphasize the importance of pupils filling in their own profiles. Moreover, given that the pupils expressed a desire to know more about their tutors, we also recommend that tutors fill in their own profiles and that these are accessible to the students in order to construct more authentic and equitable relationships.

Another built-in formulation of personalized learning that sometimes failed was TSL's strategy of enhancing pupil–tutor interactions by having the tutors routinely ask the pupils a personal question at the beginning of each session. Not only did a significant number of pupils feel that the questions were inappropriately personal and intrusive, but several identified that they had emerged from the program design rather than from authentic relationships. The pupils' exhibited a sophisticated capacity to interpret the social situation, sensing that the questions were formulaic and not grounded in genuine interest. Arguably, this worked to *un-embed* a sense of authentic social presence, as the pupils became aware of a non-human automated system design. The top-down program design did not sufficiently account for the pupils' emotional sensitivity to inappropriate questions or for their social intelligence in interpreting their lack of authenticity. As the pupils suggested, the personal questions could be replaced by questions focused on the more neutral topic of mathematics, which would simultaneously facilitate genuine collaborative input from the pupils.

Despite the tailored nature of one-to-one tuition, our research indicates that, when delivered online, it was not always able to deliver an individualized service in a deep and authentic manner. Arguably, the tension here is that a form of "digital Taylorism" (Peters & Bulut, 2011) is being deployed, whereby formerly skilled knowledge work is *standardized* through a technological medium but used to *individualize* service delivery. It is therefore perhaps unsurprising that at times it had the reverse effect of, at best, depersonalizing the interaction and, at worst, impacting negatively on it. This supports our argument for a more co-constructed collaborative alternative embedded into the online processes. McGarrah Sharp and Morris (2014), for example, explore how to design more collaborative approaches into online systems to address learners' emotions, such as anxiety, and foster virtual empathy. One-to-

one online tuition could include opportunities for pupils to provide feedback to their tutors online on what they feel their learning needs are or what they feel comfortable with, building into the system design a genuine exchange of ideas, facilitating more authentic relationships and more positive and equitable experiences of social presence.

We are not arguing that online relationships do not exist or cannot be developed, despite our findings that the pupil–tutor interaction can at times produce weak or negative social presence. To the contrary, we argue that it is beneficial to the pupils and their learning processes if online relationships are developed in a positive and authentic manner. We recommend that a more in-depth pupil–tutor interaction be developed via two interconnected processes: first, through the collaborative development of an individualized teaching model based on listening to and understanding pupils' particular learning needs; and secondly, by building *pastoral care* and emotional support into the service based on a more authentic tutor–pupil interaction.

## 5. Conclusions

Whilst one-to-one tuition is a model assumed to be ideal for attending to pupils' differentiated needs, our research findings on pupils' emotional experiences of the intervention threw this into question. There are arguably limits to the extent that tutors can gain a differentiated and in-depth understanding of the pupils as learners given the limited time and opportunities to develop personalized knowledge of the pupils. However, this did not mean that the learning was without value, nor that there was no experience of, need, or potential for pastoral care.

The pupils were shown to be socially sensitive in terms of detecting when attempts to build interpersonal relationships were formulaic as opposed to emerging from genuine authentic interest and interactions, and whilst the limitations of the time-constrained and online mode are acknowledged, we nevertheless argue for enhancing the tutor–pupil interaction by developing a more co-constructed collaborative pedagogic model. This research has suggested methods in which the system design and program processes could facilitate this, with the aim of increasing pupils' control, voice, and autonomy and producing a stronger and more positive two-way sense of social presence for both pupils and tutors.

TSL is an example of a program developer keen to invest in teacher training and research in order to improve their service, including an awareness of the need to improve tutor–pupil interactions. However, we argue that their understanding of the sometimes highly charged emotional responses of the pupils is limited, as is their exploitation of online technologies to enhance social presence and collaborative learning. We therefore emphasize that these are important learning areas for one-to-one online tuition program developers. We also argue that more work needs to be done on training the tutors to respond effectively to the emotional interactions between themselves and the pupils, specifically integrating SEL (social and emotional learning) in OLEs into their training (Stern, Harding, Holzer, & Elbertson, 2015, pp. 516–531). As planned by TSL, we recommended that one-to-one online tuition providers provide *ongoing* cultural professional development in a sympathetic teaching style, raising awareness of the pupils' anxieties and drawing on pupil feedback to shape the training.

The TSL intervention was part of a scaling-up process, and TSL is a rapidly expanding service within an expanding sector. This presents challenges in scaling up models based on providing individualized and emotionally sensitive support to pupils, to meet the demands of a larger number of pupils (Webb, 2012). This is a challenge not only in terms of providing sufficient pupil support, but also in terms of the cost of the requirements and emotional labor of the tutors. We have focused on the pupils in our study, but we recognize that this has implications on the demands placed upon the tutors. Webb (2012) argues that the drive to reduce the costs of human service labor by using online tuition needs to account for the emotional labor of the tutors. Kear et al. (2012) research on the tutors' role in creating social presence during web-conferencing also indicates that it is challenging for tutors to adapt and improvise their responses to meet different learners' needs during unpredictable real-time synchronous OLEs. This would particularly be the case if a more collaborative pupil-centered approach was adopted. Thus, whilst we argue for more tutor training regarding their emotional interactions with the pupils, we simultaneously call for the cost to the tutors, in terms of their emotional labour and teaching skills, to be appropriately supported and remunerated. Overall, we argue for more attention to the emotional experiences of online interactions, both from one-to-one online tuition developers and in academic theory and research.

In terms of limitations, we had not set out to study the emotions, but instead had understood their significance during an inductive analysis process. This meant that we had not designed the research instruments with a focus on the emotions and did not utilise existing theoretical and empirical frameworks (such as discussed in Artino, 2012) when conducting the research. Whilst we were nevertheless able to identify key activity and achievement/outcome emotions and their associated influencers (see Table 1), it would be beneficial for future research building on this study to develop the research design with explicit reference to existing theoretical frames and concepts. For example by shaping the research instruments to address dimensions such as 'effort beliefs' (Tempelaar, Niculescu, Rienties, Gijssels, and Giesbers, 2012) or 'task value' (Noteborn, Bohle Carbonell, Dailey-Hebert, & Gijssels, 2012), or to explore more precisely how the emotions related to particular triggers and constraints, or to specific parts of learning as recommended by Artino (2012). Moreover, further exploration of the association between activity and outcome emotions could be the focus of further research. On the other hand accessing data on the pupils' emotions without a clear frame arguably facilitated new and unexpected findings and contexts, such as identifying emotions *prior to* either activity or outcome emotions, or following them, such as impacting on the traditional mathematics lessons. The study also developed Artino and Jones (2012) study indicating that positive outcomes may emerge from negative emotions. It is also clear that the tutors' own emotions impacted on the pupils' emotions, which is to be expected given that the one-to-one dialogue and communication - i.e. the *interaction between pupil and tutor* - is the medium through which the learning process is progressed. However, our analysis can be regarded as a case study with wider theoretical relevance, both in terms of its nuanced analysis of the emotional context of tutor–pupil interactions and also for its development of social presence theory. Our study has nuanced the notion of social presence by highlighting that it should not be assumed to be

necessarily positive or desirable, but rather understood as a variable of social interaction, characterized by as much emotional variability as face-to-face interactions.

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